Midsegments/ Perpendicular Bisectors/ Medians/ Altitudes/ Angle Bisectors

For the previous two days, you have created the special segments in triangles. Now we are going to study the importance of the ***points of concurrency*** for triangles.

**Part 3**

A. The first one we are going to look at is the point of concurrency for **perpendicular bisectors**

1. Open your file from yesterday that you created perpendicular bisectors
2. Create a point of intersection for the three lines
3. Click on the point of intersection and one of the vertices
4. Construct “Circle by center + Point”
5. Drag the vertices of the triangle around the screen.

What do you notice about the relationship between the vertices of the triangle and the circle? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Draw two pictures showing the circle and the triangle in the spaces below.

Describe the orientation of the circle in relationship to the triangle. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Point of Concurrency:** Because of the information you have come to, we call the point of concurrency for perpendicular bisectors the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

We can conclude also that this point of concurrency is equidistance from all the vertices. Describe why this is the case: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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B. The next point of concurrency we are going to look at is one for the **angle bisectors.**

1.) Open your file from yesterday that you called angle bisectors

2.) Create the point of intersection for the three lines

3.) Click on the circle tool. The point of intersection will be your origin.

4.) Drag the circle to one of the three sides of the triangle. Move it around until you see a “skip” in the size of the circle.

5.) Create a point of intersection in the other two points the circle intersects the circle.

6.) Drag the vertices of the triangle around the screen.

What do you notice about the relationship between the sides of the triangle and the circle? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Draw two pictures showing the circle and the triangle in the spaces below.

Describe the orientation of the circle in relationship to the triangle. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Point of Concurrency:** Because of the information you have come to, we call the point of concurrency for angle bisectors the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

C. The third point of concurrency will be the one for **medians**.

1.) Open the file from yesterday that you called medians.

2.) Create the point of intersection for the three medians. LABEL THIS POINT O.

3.) Label the three vertices of the triangles A, B, and C.

4.) Create triangle interiors for AOB, BOC, and COA. Make each triangle interior a different color.

5.) Measures the areas for each of the triangles and write them on the lines below

AOB = \_\_\_\_\_\_\_\_\_\_ BOC= \_\_\_\_\_\_\_\_\_\_\_\_ COA= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Move the vertices of the triangle around. Re-record the areas of the triangles.

AOB = \_\_\_\_\_\_\_\_\_\_ BOC= \_\_\_\_\_\_\_\_\_\_\_\_ COA= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What do you notice about the areas of the three triangles that you created in the interior of the original triangle? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Point of Concurrency:** Because of the information you have come to, we call the point of concurrency for medians the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The importance of this point, which you discovered above, is that it is the center of gravity for the triangle. That is if you put this point on a pencil tip and allowed it to balance it would be perfectly flat.

D. The last point of concurrency will be the one for **altitudes.**

You have already seen that the altitudes of a triangle intersect, however, this point of intersection has no importance whatsoever. Seriously. It is just something cool that mathematicians have discovered.

**Point of Concurrency:** Because of the information you have come to, we call the point of concurrency for altitudes the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.